

# CDFW Climate College: Lecture #6



**Doug Parsons**  
National Park Service

February 12, 2013  
1:00 - 2:00PM

Climate Literacy and  
Education



# Course Reminder!

## Submission Requirements

- Submit project title and type of proposal **ASAP**.
- Final projects are due to [climatechange@wildlife.ca.gov](mailto:climatechange@wildlife.ca.gov) by May 31, 2013
- Materials to submit as your final project:
  - The final project coversheet; [Download Coversheet Template](#) (MS Word)
  - 1-3 page summary describing your project OR a poster summarizing your project (3X4 ft)
  - Any additional documentation as appropriate (e.g. your presentation slides, excerpt from a document where you incorporated climate change, etc.)

Please contact [climatechange@wildlife.ca.gov](mailto:climatechange@wildlife.ca.gov) with any questions.

## Sampling of Project Ideas – Get Creative!



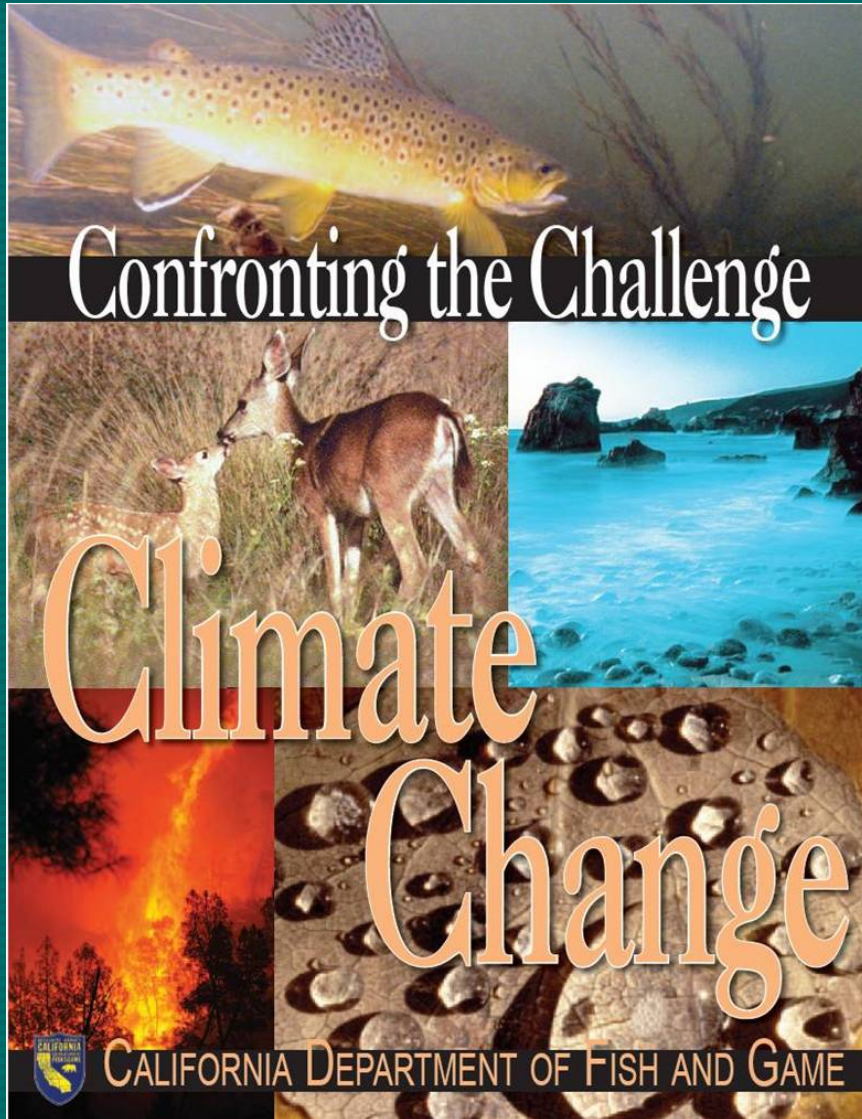
- Paper: Write a short paper (3-5 pages) describing climate change impacts to a species/habitat/topic of interest.
- Collaborative project: Work with a counterpart in another agency/organization to discuss how to work together to integrate climate change into a joint project and write up plans for how you will achieve these goals
- Presentation to Colleagues or Partners: Give a climate change-related presentation/brown bag to staff in your office
- Climate integration: Incorporate climate change into an existing work project (e.g., include climate change considerations in CEQA documents and then create a template that other staff doing similar work may benefit from)

These are just a few ideas to get you started – alternative project ideas are welcome!

# Overview of CDFW Outreach, Education, and Communication Projects

- Climate magazine
- Curriculum web page
- Climate Menu
- CDFW Staff Spotlights

# Policy outreach



- Gold award for excellence in government communications
- State Information Officers Council's 2010 competition



# For Teachers Only!

## Climate Curriculum web page

http://www.dfg.ca.gov/Climate\_and\_Energy/Climate\_Change/For\_Teachers/ For Teachers - Climate Scie...

Convert Select

CA.GOV CALIFORNIA DEPARTMENT OF FISH and WILDLIFE

Home Recreation Resource Management Enforcement Marine Spills Education Science Institute Data & Maps

Fish, Wildlife and Habitat Management

Climate Science Program Home » Climate and Energy » Climate Change » For Teachers

Activities  
Resources  
CDFW Climate College  
CDFW Climate Stakeholders  
CDFW Going Green  
Climate Change Case Studies  
Vulnerability Assessment Tools  
For Teachers  
Western Association of Fish and Wildlife Agencies  
Director's Bulletins  
Legislation and Policy

CDFW Climate Science and Renewable Energy Branch  
1416 9th Street  
Sacramento, CA 95814  
climatechange@wildlife.ca.gov

### For Teachers Only: Curriculum Resources for Biodiversity and Climate Change

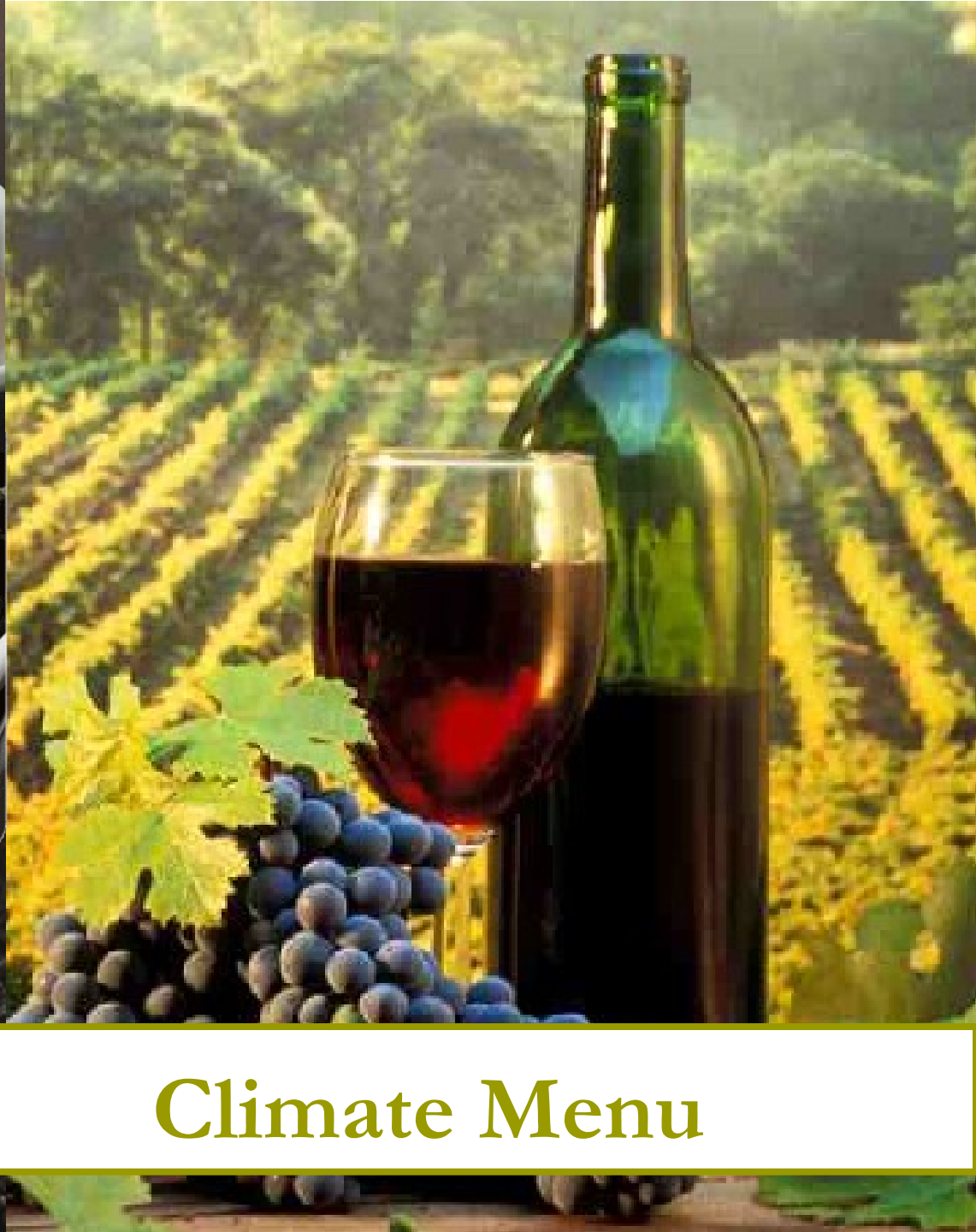
CDFW is committed to supporting and empowering our staff, partners, the public, and the next generation to be stewards of our natural resources in the face of a changing climate. Outreach and education are a key component to supporting climate change adaptation efforts that safeguard not only natural resources but people and places. CDFW's Climate Science Program staff have focused significant time working collaboratively with partners to create resources that help educate and increase awareness about climate change and positive ways to support conservation of wildlife and habitats in a changing climate. This web page was specifically created to support educators' efforts to bring climate change curriculum into the classroom so that they can inform and empower the next generation of leaders who will be responding to climate change impacts. While there are a growing number of resources for educators on climate change there are only a select number of resources that are specific to wildlife and habitats. We hope to update this list periodically as new resources become available. If you are interested in contributing information or ideas to this effort please contact [climatechange@wildlife.ca.gov](mailto:climatechange@wildlife.ca.gov)

\* Note: The following sites and materials are not endorsed by the CDFW.

### Climate Change Curriculum and Lesson Plans related to Wildlife and Habitats

- Climate Change Wildlife and Wildlands: a Toolkit for Formal and Informal Educators (US Global Change Research Program)
  - Climate change wildlands and wildlife video
- A student's guide to global climate change (EPA)
  - How climate change will impacts plants, animals, and ecosystems
- Climate change education resources (NOAA)
  - Teacher background information: climate change and ecosystem response (PDF)

http://www.dfg.ca.gov/enforcement/ 105% 10:45 AM 2/11/2013



# Climate Menu

# CLIMATE CHANGE on your plate



## MANY FOODS THAT WE ENJOY TODAY MAY BECOME MORE LIMITED IN THE FUTURE OR MAY NO LONGER BE LOCALLY HARVESTED DUE TO PROJECTED CLIMATIC CHANGES IN CALIFORNIA.

- Changes in temperature and precipitation can cause stream temperatures to rise, degrading habitat for cold water fish such as trout.
- Climate change will impact the growing season for California's agricultural products, including altering "winter chill" periods required by fruit and nut trees.
- Higher temperatures, especially at night, can substantially decrease grape quality and productivity for wine production in the state.
- Changes in snow accumulation and snowmelt can negatively impact water availability for agriculture, drinking water, and water for wildlife.
- Sea-level rise and changing ocean chemistry can degrade ocean and estuary habitats that protect our fisheries.

## RECIPE FOR ACTION

The state is committed to reducing the causes of climate change and responding to the impacts now and in the future. Here's how you can help:

- Walk, bike or car-pool to lower your contributions to climate change.
- When available, buy local to reduce the distance your food must travel.
- Conserve water - reducing water use also reduces energy use and greenhouse gas emissions.
- Collaborate with state agencies to conserve California's natural resources and safeguard wildlife and water for the benefit and health of all Californians.



**California State Agencies are working  
collaboratively to safeguard the food on your plate.**

[www.dfg.ca.gov/climatechange](http://www.dfg.ca.gov/climatechange)



# CDFW Climate & Sustainability Spotlights



## DFG SPOTLIGHT ON CLIMATE CHANGE

FEATURING: GORDON LEPPIG



**Q. What kind of work do you do for DFG and how long have you been with the Department?**

A. My 10 year tenure with DFG has focused on project review and permitting. I have reviewed timber harvesting plans, city and county general plans, and major developments such as bridge, highway and wind energy projects. My purpose is to determine what, if any, significant environmental impacts a project may have and recommend feasible ways to avoid or minimize those impacts. For the past year, I have been the lead on the Klamath River dam removal project Environmental Impact Report.

**Q. What is your favorite part of California and why? Do you have a favorite CA species? Favorite habitat type? And why?**

A. I am smitten by California's coastal ecosystems. I love the beaches and dunes, the lagoons, bays, salt marshes and estuaries. They are teeming and energized with life: whales, seals, otters, fish, birds, interesting plants and fungi. For me, California's coastal habitats embody beauty, complexity, diversity, and tranquility. Sitka spruce, on land, and eel-grass, in the estuaries, both hold special charm and are habitat for numerous other critters.

**Q. What is your biggest concern regarding climate change?**

A. I am very concerned that sea level rise and changed ocean conditions could result in habitat loss resulting in the decline of numerous species. Plus, millions of Californians live near the Pacific Ocean because they value its beauty and many other amenities. Thus, the potential loss of coastal dunes, sea bluffs, salt marshes and estuaries to sea level rise could also threaten our coastal human communities. This could affect our quality of life, including where we live, what we eat, how we recreate, our health and safety during storm and flood events, and for many, such as commercial fishers and crabbers, their careers and economic well-being.

**Q. In ten years how do you think the responsibilities of your position will change due to climate change?**

A. I think DFG will need to engage in more robust regional planning efforts. We will work more closely with more partners to develop scenario-based planning and adaptive co-management approaches to protect whole ecosystems and ranges of species. Our emphasis will shift more to a regional and proactive conservation stance from a current approach that is often more population-focused and project-responsive.

**Q. What do you see as some of the short term opportunities for DFG to address climate change?**



A. DFG is just beginning to make reducing our carbon footprint a major departmental objective. I applaud this and hope we continue implementing sustainability programs with alacrity. A fleet of high-efficiency cars would help and the paperless office initiative could be a game-changer in optimizing how we conduct business. I think we will continue to seize opportunities to raise climate change and sea level rise-related impacts during our project review and regional planning work. To enhance our effectiveness, I believe DFG staff would benefit from more training and assistance with climate change impact assessment and in promoting adaptation strategies.



- Building a DFW  
Climate Community



# CDFW Sustainability Superstars

**CALIFORNIA DEPARTMENT OF FISH and WILDLIFE**

Home Recreation Resource Management Enforcement Marine Spills Education Science Institute Data & Maps

Fish, Wildlife and Habitat Management |

**Climate Science Program** Home » Climate and Energy » Going Green » Sustainability Superstars

- » Activities
- » Resources
- » CDFW Climate College
- » CDFW Climate Stakeholders
- » CDFW Going Green
- » Climate Change Case Studies
- » Vulnerability Assessment Tools
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1416 9th Street  
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[climatechange@dfg.ca.gov](mailto:climatechange@dfg.ca.gov)

## CDFW Going Green: Sustainability Superstars!


CDFW's Going Green team, initially comprised of a handful of members, has grown to include over 150 staff at different times and in varying capacities since its inception. As a result of their efforts, the Going Green core team was recognized by CDFW with an Employee Excellence Award. The Going Green team was one of only two recipients of this award in 2012. To highlight some of the activities that have made the Going Green initiative what it is today, we have compiled the list of stories below that demonstrate some of the actions being taken by CDFW Going Green team members and other staff to increase sustainable operations at CDFW.

If you would like to recognize an individual or group of CDFW staff that are making a difference as sustainability superstars, please contact us at [climatechange@dfg.ca.gov](mailto:climatechange@dfg.ca.gov).

### Crilly Butler, IT Branch: Paper to Electronic Form Migration Project



CDFW believes that converting internal paper-based forms to an automated, electronic document format utilizing electronic signatures will save time and money, improve speed and efficiency, and reduce CDFW's overall carbon footprint. Crilly Butler has taken a lead role in migrating older-generation fill-and-print forms to an all-electronic form-processing technology. This will eventually enable forms to be routed around the department through their entire lifecycle using digital signatures and an automated workflow engine following the business rules specific to each form. One by one, forms are being converted to use this new technology, and ultimately most of the department's forms processing will be digital.



And last but not least.....

the CDFW Climate  
College!

# CDFW Climate College: Lecture #6



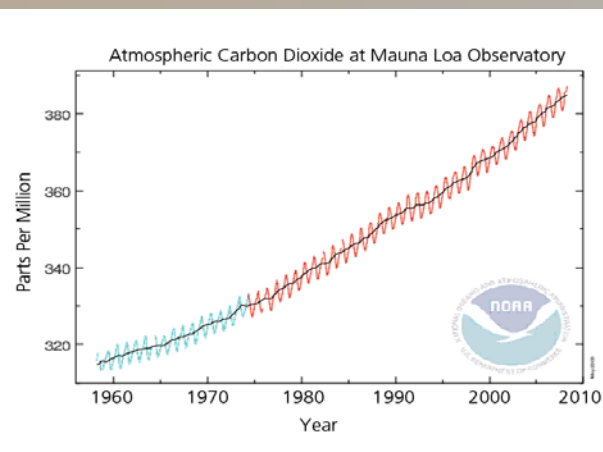
**Doug Parsons**  
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Climate Literacy and  
Education



# Climate Change Training and Education: The Florida and NPS Models



**Doug Parsons, Climate Change Liaison  
National Park Service  
California Department of Fish and Wildlife  
February 12th, Sacramento, California**





# Paradise in Peril: Adventures in Climate Change planning in Florida.





# Florida Fish and Wildlife Conservation Commission

## Mission

Managing fish and wildlife resources for their long-term well-being and the benefit of people.

## Staff

1,947 full-time employees

Locations:

- Headquarters in Tallahassee
- Five regional offices:  
Panama City, Lake City, Ocala, Lakeland and West Palm Beach
- Fish and Wildlife Research Institute in St. Petersburg
- 76 field offices and facilities





# Florida Fish and Wildlife Conservation Commission

## Territory

- 53,927 square miles of land
- 12,133 square miles of water
- More than 34 million acres of public and private land
- Including 5.8 million acres of wildlife management areas (one of the largest public-hunting systems in the country)
- 2,276 miles of tidal shoreline (8,426 "detailed" miles)\*
- Approximately 12,000 miles of fishable rivers, streams and canals
- About 7,700 lakes (of 10+ acres), covering 3 million total acres

## Fish and Wildlife

- More than 575 species of wildlife
- More than 200 native species of freshwater fish
- More than 500 native species of saltwater fish
- ...balancing these species' needs with the needs of nearly 19 million residents and the millions of visitors who share the land and water with Florida's wildlife.





# FWC Climate Change Resolution

ix A  
on

## Resolution

The Board of the Florida Fish and Wildlife Conservation Commission hereby declares on this 12th day of September in the year 2007:

**WHEREAS**, the Florida Fish and Wildlife Conservation Commission is a constitutionally created governmental agency dedicated to the cause of fish and wildlife conservation for the benefit of Florida residents and visitors, and

**WHEREAS**, a growing body of science indicates there has been a global rise in temperatures over the past half-century, and

**WHEREAS**, human activities are at least partially responsible for global climate change, and

**WHEREAS**, global climate change can affect Florida's fish and wildlife and their habitats, and

**WHEREAS**, global climate change creates an intensified hydrological cycle, resulting in an increase in extreme precipitation, flooding and droughts, and

**WHEREAS**, global climate change can disrupt Florida's unique natural systems and affect unique species of the fish and wildlife that depend on these systems, and

**WHEREAS**, global climate change can cause ocean temperatures and levels to rise thereby altering coastal wetlands, estuaries and barrier islands, and increasing saltwater intrusion, and

**WHEREAS**, the mostly subtropical non-native invasive plants and animals in Florida will spread unchecked by warming trends, hurricanes, and hydrologic changes, and

**WHEREAS**, the State of Florida includes 53,927 square miles of land, 10,550 miles of rivers and streams, over 7,700 lakes, reservoirs and ponds, 663 miles of beaches, 2,276 statute miles of tidal shoreline, and more coastline than any other state, except Alaska, and

**WHEREAS**, owing to its geographic location, subtropical to temperate flora and fauna, peninsular configuration and low topography, Florida and its fish, wildlife and ecosystems are likely to be more affected than other states to changing sea levels, climatic extremes, and warming trends, and

**WHEREAS**, Florida's fish and wildlife resources and boating generate over \$30 billion in economic impact and over 338,000 jobs for Florida's economy, and

**WHEREAS**, all Floridians depend on healthy fish, wildlife and ecosystems, which are of critical economic importance to the State of Florida,



Florida Fish  
and Wildlife  
Conservation  
Commission



**NOW THEREFORE**, be it resolved by the Florida Fish and Wildlife Conservation Commission in a duly constituted and assembled meeting:

1. That we do hereby express our deep concern as to the potential effects of ongoing global climate change on the fish and wildlife resources of the State of Florida.
2. That we hereby encourage and support science and management that will effectively assess the future effects of global climate change on Florida's fish, wildlife and ecosystems.
3. That we hereby direct the staff of the Commission to engage with other experts from government, academia, industry and conservation organizations to develop recommendations for conserving fish and wildlife in the face of global climate change.
4. That we support state, federal and international programs that will reduce or abate human-induced causes of global climate change.
5. That we do hereby record the sentiments of this resolution forevermore in the minutes and records of the Florida Fish and Wildlife Conservation Commission.

**DONE AND RESOLVED** at St. Petersburg, Florida this 12<sup>th</sup> day of September, 2007.

Chairman Rodney Barron

Commissioner Ronald D. Bergeron

Commissioner Kenneth W. Wright

Commissioner Kathy Barco

Commissioner Richard A. "Dick" Cornett

Commissioner Brian S. Yablonski

Commissioner Doreen Stephenson

Attest:



# Climate Summit



## Goal Statement

Florida's wildlife will face unprecedented consequences associated with climate change. With this forecast, presenters and workshop participants will identify key research needs, improve awareness of impacts on wildlife, and develop ideas to optimize species conservation for integration into Florida Fish and Wildlife's comprehensive climate change strategy.





# Summit Structure



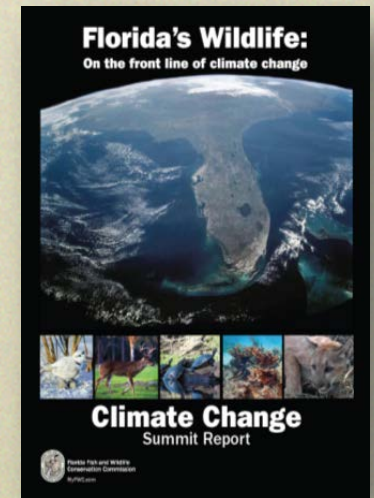
- Hunting and Fishing
- Inland aquatic and semi-aquatic ecosystems
- Invasive organisms on biodiversity in future climates
- Marine, estuarine and coastal ecosystems
- Native terrestrial species, communities and ecosystems
- Natural resource management and land-use planning
- Highest levels of FWC leadership were involved.





# Major Findings - Needs

- Customize predictive models to Florida
- Develop integrated data and monitoring
- Build broad support and action
- Nurture a coordinated state response
- Manage the landscape for wildlife resiliency
- Protect landscape corridors
- Review priorities in light of a dynamic environment
- Build on strategic and funding opportunities
- Provide inspired leadership in the face of uncertainty

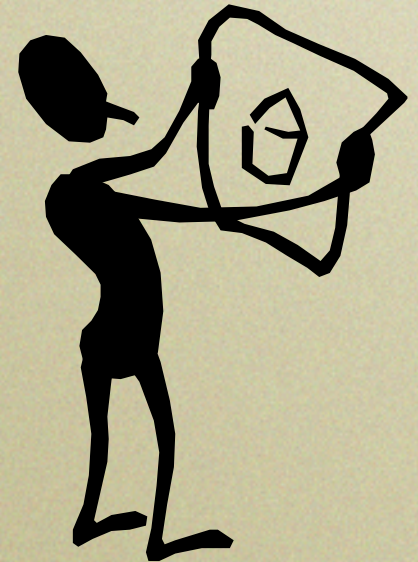




# FWC Climate Change Internal Survey



- Survey sent out to all employees
- Senior Leadership Team sent out directly
- 350+/- responded (2200+ employees)
- Two key questions on climate change
- Comment section
- Creating an identity:  
Branding Climate Change





# Quotes from the Survey

- *As a science-based management agency, employees should be encouraged to review the best scientific information available before drawing conclusions.*
- *I hope no tax dollars and/or FWC money is used to promote this agenda. there is other science out there that disagrees with this.*
- *During these hard economic times it is not feasible for our agency to be wasting time and funds on this subject.*
- *We can't change the weather and we are not responsible for weather cycles that have occurred.*
- *FWC does very little to contribute, especially given we can't travel anywhere.*







## The ClimateNiche Blog

### Blog Admin

Create Post  
Create Category  
Manage Posts  
Manage Comments  
Manage Categories  
Manage Links  
Blog Settings

### Archives

August 2009 (18)  
September 2009 (27)  
October 2009 (16)  
November 2009 (17)  
December 2009 (18)  
January 2010 (17)  
February 2010 (18)  
March 2010 (17)  
April 2010 (16) May  
2010 (10) June 2010  
(6) July 2010 (3)  
August 2010 (7)  
September 2010 (8)  
October 2010 (3)  
December 2010 (8)  
January 2011 (6)  
February 2011 (2)  
April 2011 (1)

### Categories

Blogging  
Ornithology  
Marine/Coastal  
International  
Weather  
Legislation  
Wildlife  
Ecosystems  
Research  
FWC  
Florida-based  
Federal

Internal blog for all things climate change and its impact to Florida's fish and wildlife.  
(Photo: © Blair Witherington)

2/10/2011

## What Can We Expect From Climate Change in the Southeast

Perhaps the most common question we hear from our Research and Monitoring subgroup members is: what changes can we expect in the future from climate change? In general, the global circulation models (GCMs) have not been very good at predicting changes other than sea level rise for Florida. As those of you who attended the first climate course heard, however, the USGS should have some new information this year from downscaled runs of the GCMs. In the meantime, the [U.S. Global Change Research Program](#) published a report in 2009 entitled [Global Climate Change Impacts in the United States](#). This program in general, and this report more specifically, is a multi-agency effort to examine the full body of climate change literature and, among other duties, provide a synthetic guide to the state of the science with respect to the U.S. The report goes into the impacts to society as well as the environment.

So back to the original question: what can we expect in the Southeast? This is taken directly from the Key Issues part of the report for the U.S. Southeast (with hyperlinks to the corresponding part of the report):

- [Projected increases in air and water temperatures will cause heat-related stresses for people, plants, and animals.](#)
- [Decreased water availability is very likely to affect the region's economy as well as its natural systems.](#)
- [Sea-level rise and the likely increase in hurricane intensity and associated storm surge will be among the most serious consequences of climate change.](#)
- [Ecological thresholds are likely to be crossed throughout the region, causing major disruptions to ecosystems and to the benefits they provide to people.](#)
- [Quality of life will be affected by increasing heat stress, water scarcity, severe weather events, and reduced availability of insurance for at-risk properties.](#)





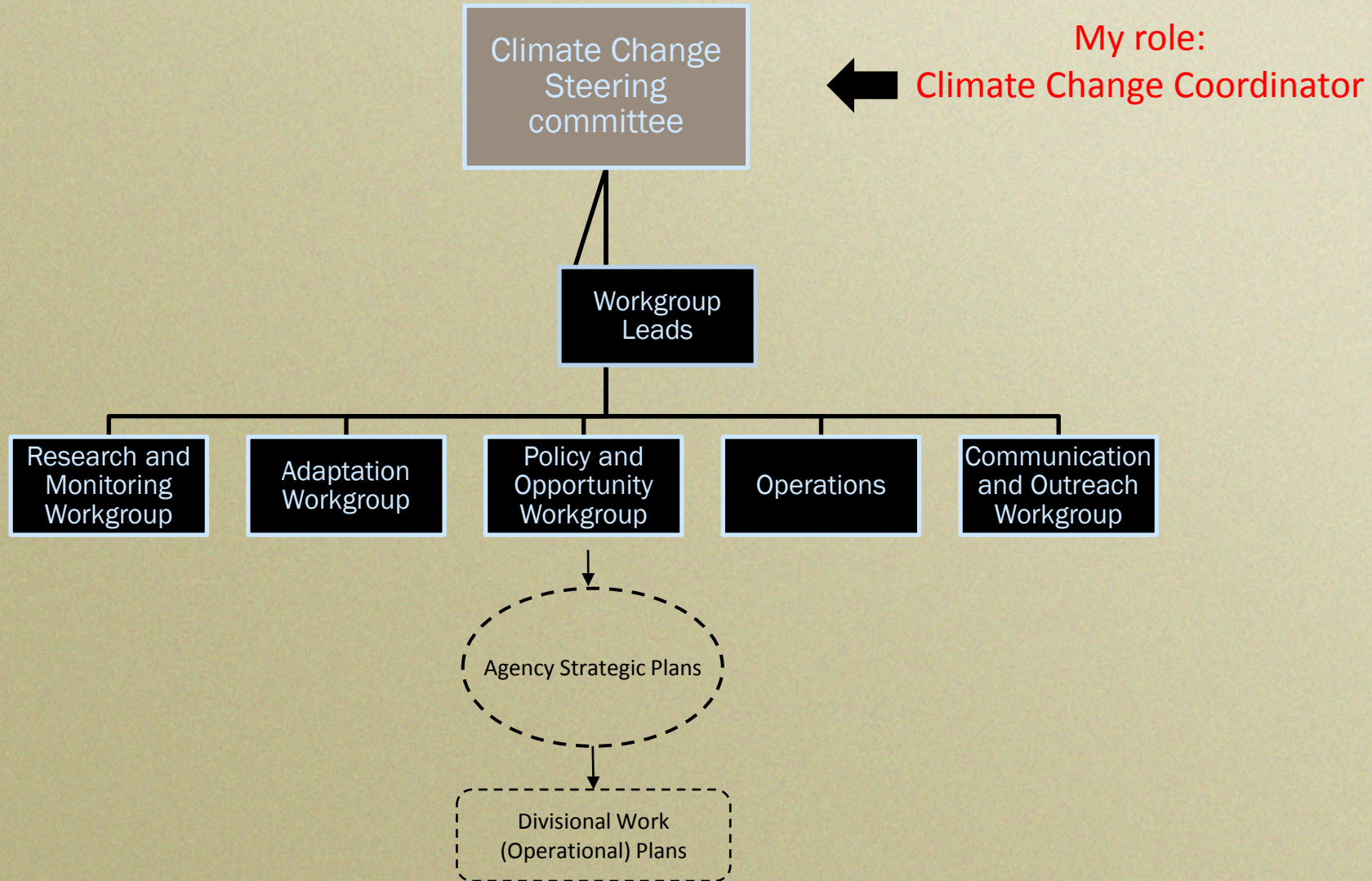
# FWC Climate Change Planning

- Development of Climate Change Steering Team
  - Developed Agency Climate Change Structure
  - Assisted with Planning Process





# FWC Climate Change Structure





# Workgroups and Sub-teams

- Research and Monitoring
- Adaptation
  - Sub-teams followed summit break-out groups
    - Terrestrial
    - Marine
    - Freshwater
    - Hunting and Fishing
    - Natural Resource Mgmt
    - Invasive Species





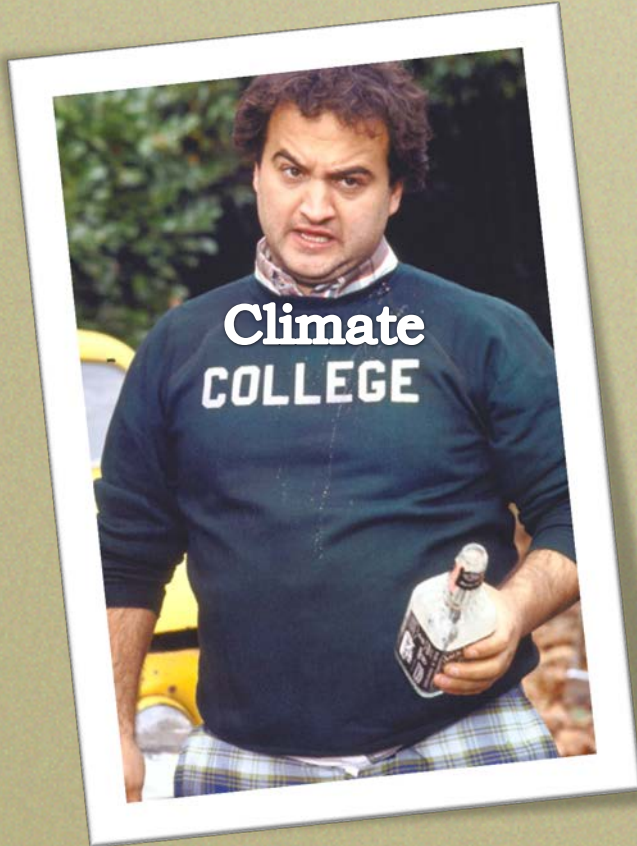


## Climate Change Certification of Completion





# Course Structure

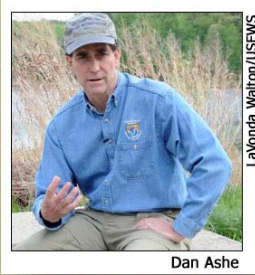


1. Monthly Speakers
2. Required Readings
3. Forum participation
4. Final Project





# Course Timeline Speaker Schedule



- February 2 – **Dr. Adam Terando**/NC State
- March 2 – **Patty Glick**/National Wildlife Federation



- April 4/ **Dr. Jessica Thompson** /Colorado State and **Dr. Susan Cameron Devitt**/UF

- May 4 - **Dr. Reed Noss**/UCF

- June 1 – **Dr. Mark Shaffer**/Climate Change Advisor USFWS



- July 13 – **Dr. Eric Barron**/President of FSU and **Alex Score**/EcoAdapt

- August 29– **Dan Ashe**/USFWS

- October– Participant presentations





# ***For those who stick it out...***



## Final Project Competition

- *Powerpoint – Integrating adaption into your day job.*
- *Short article, same topic.*
- *Winner goes to...*





# ***For those who stick it out...***



## Final Project Competition

- *Powerpoint – Integrating adaption into your day job.*
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- *Winner goes to...*






***Thank you Defenders!***





# Discussion Board

Add a new discussion topic

Discussion		Started by	Replies	Last post
<a href="#">NY Times Opinion Piece on Global Warming</a>		Laura Jerome	0	Laura Jerome Wed, Sep 14, 2011, 11:54 AM
<a href="#">Survey of Americans on Climate change</a>		Doug Parsons	2	Laura Jerome Fri, Sep 9, 2011, 01:18 PM
<a href="#">news media vs. the scientific literature</a>		Maria Merrill	1	Laura Jerome Mon, Aug 29, 2011, 08:36 AM
<a href="#">Trans-generational Disconnect</a>		Shane Belson	3	Beth Stys Fri, Aug 26, 2011, 02:48 PM
<a href="#">hybridization - good or bad?</a>		Beth Stys	0	Beth Stys Wed, Aug 24, 2011, 01:39 PM
<a href="#">Fox News Admits the Facts Back Man-Made Global Warming</a>		Ruark Cleary	2	Shane Belson Wed, Aug 24, 2011, 01:04 PM
<a href="#">invasive -- or not</a>		Beth Stys	0	Beth Stys Wed, Aug 24, 2011, 12:11 PM
<a href="#">bottoms up!</a>		Richard Flamm	5	Rebecca Telesco Tue, Aug 16, 2011, 03:35 PM
<a href="#">ParkScience special issue on climate change and communication</a>		Ruark Cleary	0	Ruark Cleary Thu, Aug 11, 2011, 02:31 PM
<a href="#">'Extra' Cover Story on Media and Climate Change</a>		Ruark Cleary	0	Ruark Cleary Tue, Aug 9, 2011, 03:45 PM
<a href="#">NASA website - including climate uncertainties</a>		Laura Jerome	2	Richard Flamm Mon, Jul 25, 2011, 09:31 AM
<a href="#">Western Governors, NOAA agree to work together to improve climate services for the West</a>		Ruark Cleary	1	Laura Jerome Fri, Jul 15, 2011, 10:49 AM



# Paper/Presentation Topics

- Building the Ark: Towards a Comprehensive Climate Change Conservation Strategy for Florida.
- Climate change and its effects on wildlife diseases, with emphasis on Lyme disease.
- The potential effects of climate change on the reproductive phenology and range of the American alligator.
- Climate Change affects on Freshwater SGCN in Priority Basins
- Potential effects of climate change on the Florida manatee
- Climate change vulnerability assessments – what are they, what do they really tell us, what has been done in Florida.
- Effects of Climate Change on Wading Birds in North America.
- Climate Change Perception, Social Wildlife Values, and the Cultural Conflicts in Mitigation Efforts.







## FWC Climate Change Certification of Completion

Brian Griffin

has completed the 2011 Climate  
Change Certification of Completion.



ASSOCIATION of  
FISH & WILDLIFE  
AGENCIES

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Nick Wiley, Executive Director  
Florida Fish and Wildlife Conservation Commission





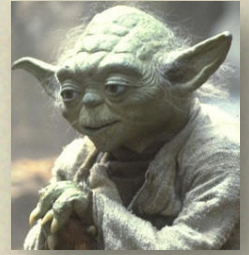
# Key Stats

- Planning team
- 100 FWC Employees enrolled
- All divisions represented
- Statewide
- Total Dollar Cost: **\$0.00!**





# Lessons Learned



- Assists all staff (science, management, law enforcement and support) in having the basic knowledge.
- Responds to a need for more in-house science/technical courses.
- Promotes networking of across work units and geographic locations.
- Promotes general knowledge of the responsibilities of staff in different positions in the agency.
- Promotes networking with other governmental agencies, non-profit organizations and academic institutions.
- Displays to senior leadership interest from staff in climate change.
- Very rare opportunity for true institutional change.





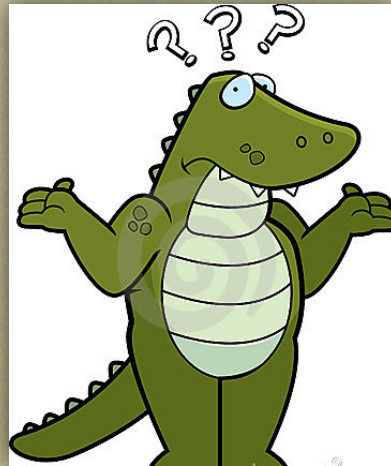
# Captive Audience

- Two presentations: Dan Ashe's and Thomas Eason, discussing all FWC activities.
- Most of Senior Leadership Team.
- Dan Ashe and Nick Wiley answering questions.
- Commissioner also present.
- Full throated commitment to the issue.
- First time a director from USFWS actually visited headquarters.





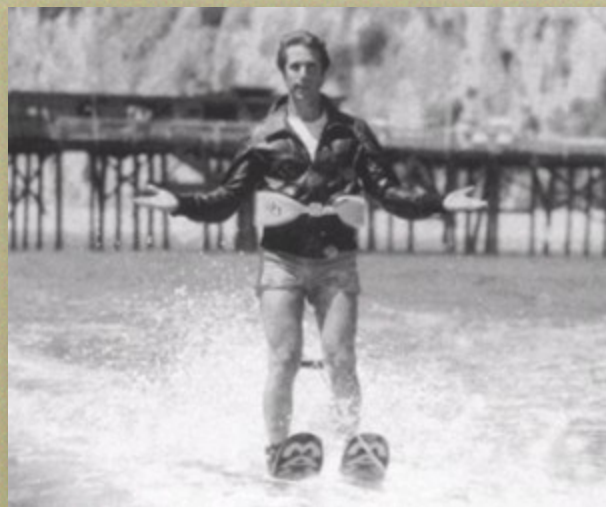
# Why a climate course?





# *Don't jump the shark!*

*Future scenario Modeling*



*Stepped back, realized people  
not comfortable with the issue  
of climate change.*

*Degrees of uncertainty*

*Vulnerability assessments*

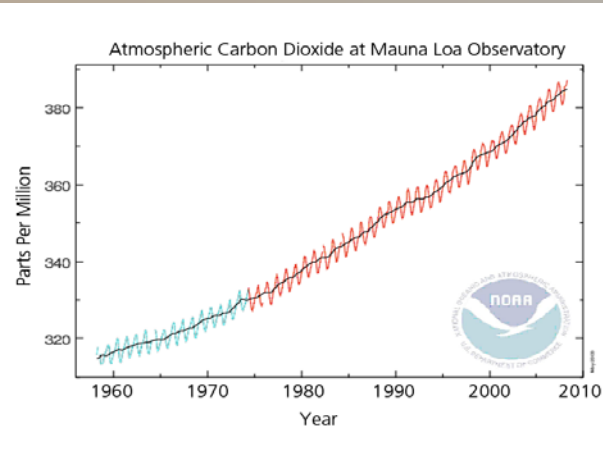
*Sea level Rise planning*

*Temperature modeling*





# Climate Change Training and Education: Florida and NPS Style



**Doug Parsons, Climate Change Liaison  
National Park Service  
California Fish and Game Commission  
February 12th, Sacramento, California**





# Climate Change Staff



**Leigh Welling**  
Chief  
Fort Collins, CO

## Adaptation



**Cat Hawkins Hoffman**  
Adaptation Coordinator  
Fort Collins, CO



**Nick Fisichelli**  
Ecologist  
Fort Collins, CO



**Doug Parsons**  
Liaison  
Washington, DC

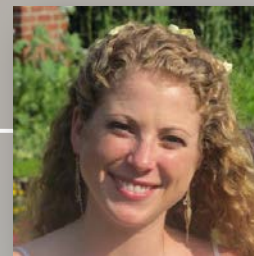


**Patrick Gonzalez**  
Climate Change Scientist  
Washington, DC

## Science



**Tim Watkins**  
Science & Education  
Coordinator  
Washington, DC



**Melanie Wood**  
Program Assistant  
Fort Collins, CO

## Communication



**Angie Richman**  
Communication Specialist  
Fort Collins, CO



**Elisabeth Cohen**  
Education & Training  
Specialist  
Fort Collins, CO



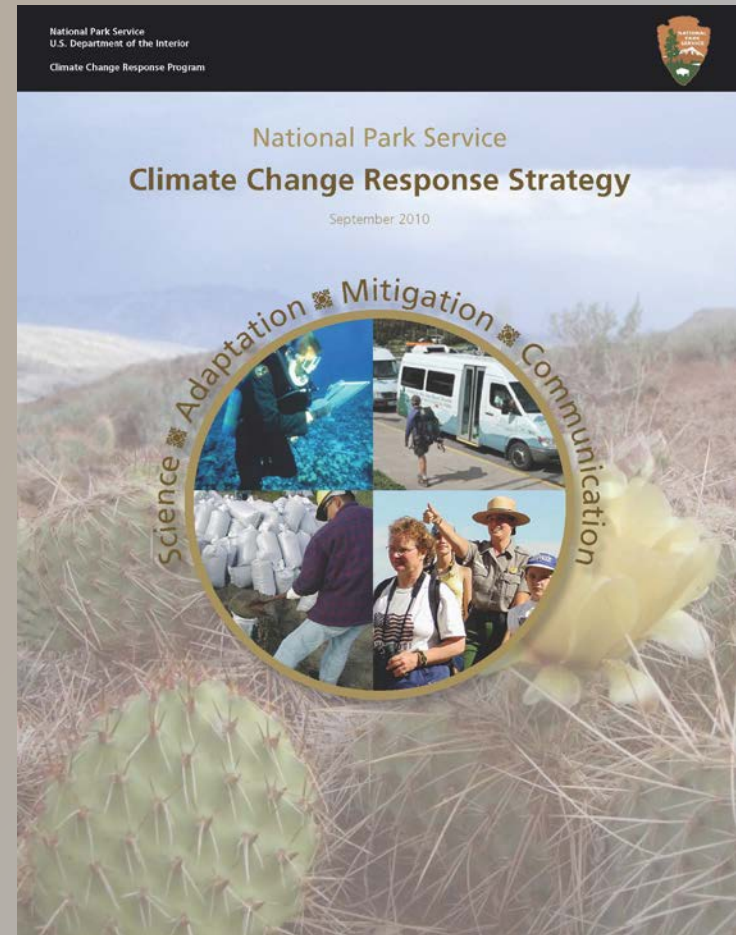


# Climate Change Response Strategy

## 4 Key Elements

- Science
- Adaptation
- Mitigation
- Communication

CCRP Action Plan just released!



## Natural Heritage Areas







## Priority Actions for FY12/13

1. Enhance Workforce Literacy
  - Climate Change Literacy Training
2. Effective Planning Frameworks & Guidance
  - Construction, Facilities, & Transportation
  - Park Plans & Strategic Planning
3. Support Basic Climate Science
  - Synthesis of Current Information
  - Vulnerability & Risk Assessment
4. Implement Green Parks Plan
  - Sustainable Operations







## Priority Actions for FY12/13

5. Robust Partnerships & Collaboration
  - Landscape Collaboration
  - Sustainable Communities
6. Appropriate Adaptation Tools & Options
  - Policy Review & Guidance
  - Adaptation Toolbox
7. Strengthen Communication
  - Interpretation & Education
  - Service-wide Communication
8. Encourage Youth Activities
  - Tomorrow's Innovators







# Climate Training

## Key Climate Change Messages



- Climate change is happening and human activities are contributing to and accelerating it.
- Changing climate has consequences for parks, people, and the planet.
- The NPS is responding with practices that address climate change.
- The choices we make now may help to avoid catastrophic impacts in the future.



# National Products

- Bimonthly newsletter
- Monthly webinar
- 11 bioregional talking point summaries
- Climate change briefs
- Internal and public websites
- Biannual *Sustainability News* magazine
- Park Videos

[www.nps.gov/climatechange](http://www.nps.gov/climatechange)





# Climate Change Outreach and Education

- In July, a pilot training was launched for park managers in partnership with the New Superintendents Academy to specifically address risk-taking, decision-making, and best practices for managing parks in a changing climate.
- Collaboration between the Interpretation and Education Directorate, the Climate Change Response Program, and the Harper's Ferry Center to network a series of climate change exhibits in parks.
- A competency for front-line interpreters was created in 2011 to give them the tools and confidence they need to speak about climate change



## National Partnerships

The NPS partners with other agencies and organizations to collaboratively communicate about climate change. One example is the NSF-funded Climate Change Education Partnership.





# Park – Level Engagement

## Staff Awareness

Everglades conducted a park-wide climate change interp training.

## Public Awareness

Staff at Yosemite are presenting public programs on climate change.

## Engagement

Staff at Great Smokys host citizen science programs to engage visitors, volunteers, and local communities.

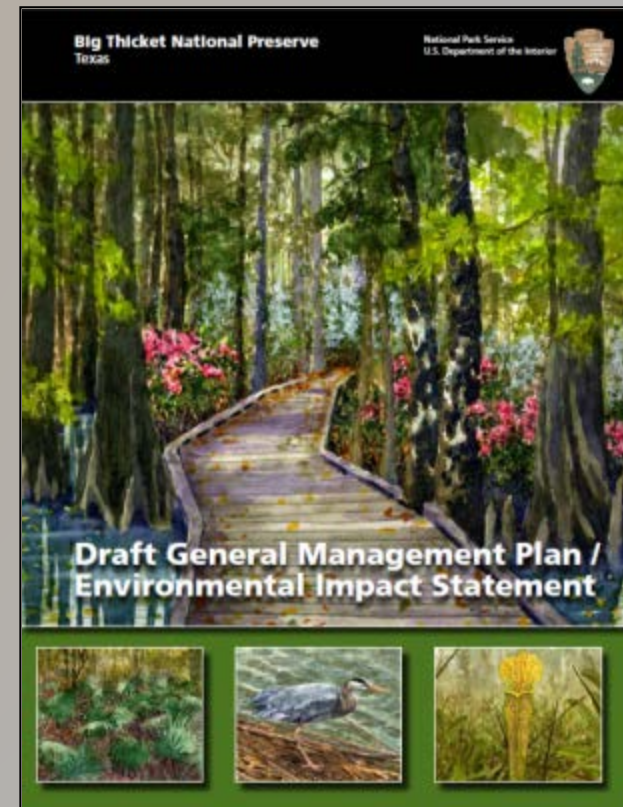




# Planning – Park & Strategic

SO 3289 *Bureaus will consider & analyze potential climate change impacts in long-range planning, setting research priorities, developing multi-year plans, and making major resource decisions.*

- Guidance: Climate change included in guidance for new Planning Framework and Foundation Documents
- ALL parks, Foundation Documents by 2016
- Incorporating CC in Planning Document Reviews & Construction standards
- Science and decision tools (driver & impact tables, vulnerability assessments, scenarios) inform plans





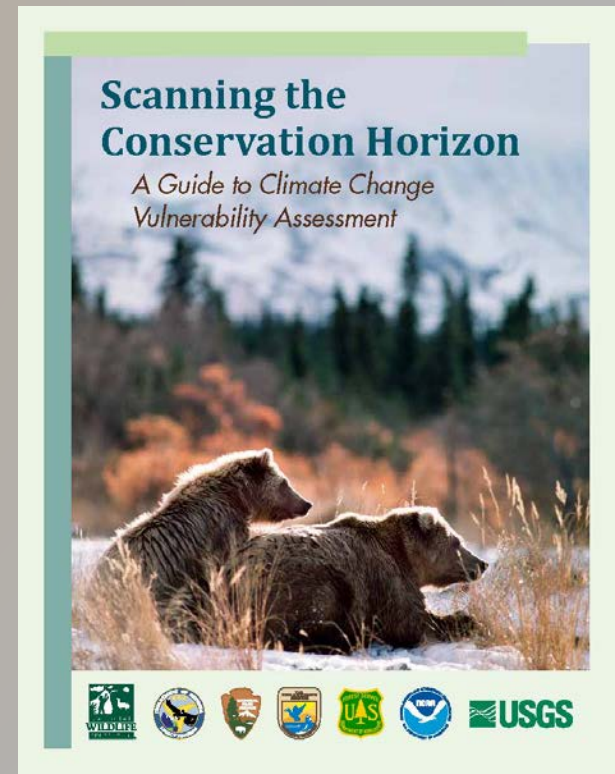
# Climate Support Basic Climate Science - Vulnerability Assessments

NPS supported Interagency Guide to Vulnerability Assessment

Park based assessments underway - are reported to DOI

## Examples

- Coastal vulnerability to sea level rise (22 parks; multi-region)
- Pika (8 parks; multi-region)
- Bighorn Sheep (9 parks; multi-region)
- Potomac and Anacostia Rivers (NCR)
- Badlands NP – 1<sup>st</sup> integrated CR/NR assessment (MWR)



# Climate Adaptation Policy Guidance – Director's Memo – applying NPS Management Policies in Context of Context of Climate Change

March 2012



United States Department of the Interior

NATIONAL PARK SERVICE  
1849 C Street, N.W.  
Washington, D.C. 20240

IN REPLY REFER TO:

N42

MAR 06 2012

Memorandum

To: National Leadership Council  
All Superintendents

From: Director *Walter D. Sullivan*

Subject: Applying National Park Service Management Policies in the Context of Climate Change

This memorandum addresses emergent questions regarding the influence of climate change on the guiding principles of park natural resource management. Additional policy memos will follow regarding management of other issues, such as facilities and cultural resources. Our planet is warming and the effects are here and now; current and projected impacts from climate change will increasingly become compelling considerations in park management decisions.

The National Park Service (NPS) Climate Change Response Strategy guides our efforts in developing responses to climate change. The pervasiveness of climate change requires that we reexamine our approaches to park management and consider what a larger magnitude of change means for our responsibilities to:

- Conserve natural systems, processes, and native biodiversity; protect our cultural and historic heritage; and provide for the enjoyment of the same;
- Determine desired natural, cultural, and experiential conditions;
- Address the inevitable movement, loss, or gain of species associated with parks;
- Address the inevitable loss of cultural knowledge and resources of parks and associated communities;
- Develop and implement park plans;
- Site and construct park facilities; and
- Balance flexibility and adaptive management with the need for consistency across the Service in decision-making processes.

These are important considerations that challenge us to think in new ways. As our management approaches evolve within a context of greater uncertainty, *Management Policies 2006* provides comprehensive and flexible guidance to deal with the challenges of climate change, and remains as the central guidance for conserving park resources and providing for visitor enjoyment. Our management policies require that decisions be grounded in best available science. They require careful consideration of all pertinent factors, and transparent decision-making through public

- Identifies management flexibility to guide action in the face of climate change
- not required to do what is impossible, economically infeasible, or likely ineffectual.
- must engage partners and use best available science to inform planning and decisions





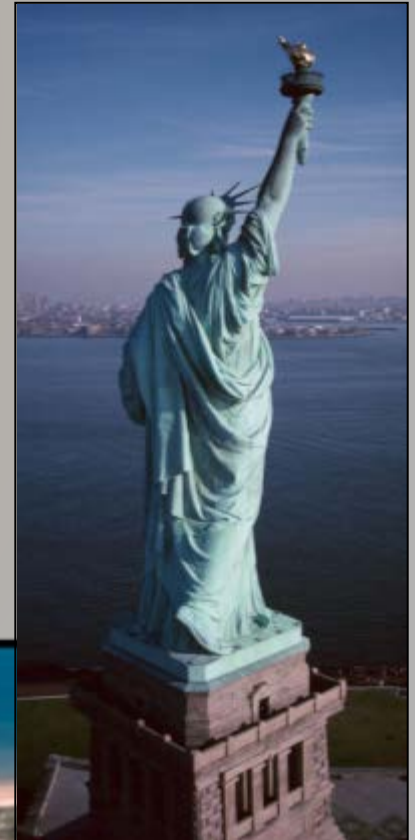
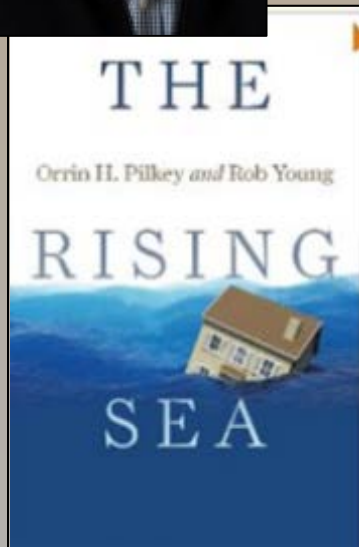
# Climate Adaptation Tool - Coastal

Dr. Robert Young – Director of WCU/Duke University Program for the Study of Developed Shorelines.



Adaptation options  
handbook for NPS response  
to sea level rise and storms

*FY12/13*



# Climate Adaptation Tools – Cultural Resources

Cultural resources provide:

- Paleoenvironmental record
- Examples of human and social change
- Means of storing and retrieving narratives about past conditions and human “adaptation”



NPS assists partners in understanding CC effects on cultural resources and traditions, and exploring adaptation options.

- LCC Cultural Resources White Paper
- Outreach/education within other national programs

## NATIONAL LCC NETWORK CULTURAL RESOURCES WORK GROUP WHITE PAPER

**DRAFT – DO NOT DISTRIBUTE**

*Note: NPS staff participated in a working group with LCC Coordinators to develop this white paper, which is under consideration now for LCC guidance.*

United States  
Global Change  
Research Program



Maritime  
Heritage



Subcommittee  
on Disaster  
Reduction

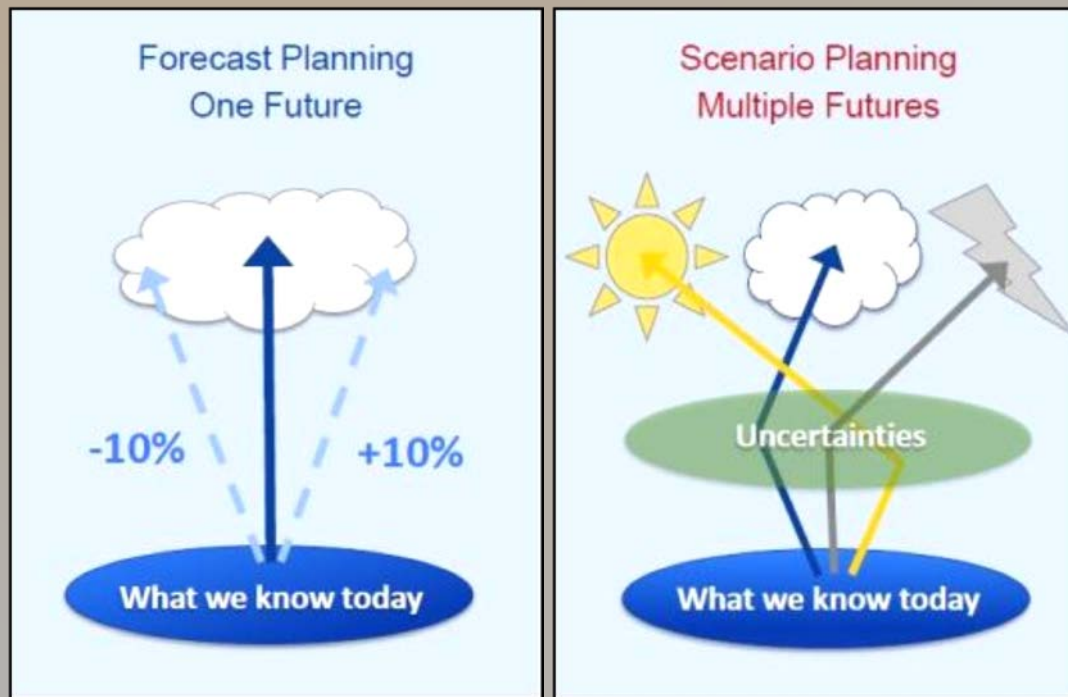
Tribes & Native  
Peoples





# Adaptation Tools – Scenario Planning

- Scenarios are stories that offer a range of plausible future environments – not predictions, projections, or models
- Provide a framework to support decisions under conditions that are uncertain, and uncontrollable



## Park and Landscape-Level Case Studies and Training

Joshua Tree NP  
Kaloko-Honokohau NHP  
Assateague Island NS  
Wind Cave NP  
Crown of the Continent  
Ecosystem  
Arctic and Coastal Alaska  
Great Lakes  
Atlantic Coast  
Eastern Forests  
Urban Landscapes  
Western Mountains  
Arid Lands  
Pacific Islands

Graphics: GBN





# Climate Youth Initiative

## George Melendez Wright Climate Change Internship & Fellowship Program

### Internship Program

- 3 mo. Internships in parks / program offices
- On-the-ground work with NPS defined projects



### Fellowship Program

- Student-defined research projects
- Funding ranges from \$5,000 – 20,000 / project





Thank you.



# CDFW Climate College: Lecture #7



**Ashley Conrad-Saydah**  
Cal EPA

March 12, 2013  
1:30 - 2:30PM

**Energy-Climate-Human Nexus:**  
Climate Action co-benefits for  
Natural Resource Conservation

